

Claims

1. A communication system comprising a core network coupled over multiple isolated connections to a plurality of distribution gateways each providing network access capacity to local data devices serviceable thereby, at least some of the plurality of distribution gateways interconnected through communication resources and wherein said interconnected distribution gateways each includes:

control functionality arranged to administer access to the core network through securing network access capacity using the interconnected distribution gateways via at least one of the multiple isolated connections.

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2. The communication system of claim 1, wherein the control functionality operates according to at least one of:

a bandwidth-driven requirement; and

a fault-driven basis to secure access to the core network.

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3. The communication system of claim 1, wherein the control functionality includes a prioritisation function that secures a guaranteed minimum bandwidth for communication with the core network for associated data equipment.

- 20 4. The communication system of claim 1, wherein at least some of the isolated connections are point-to-point connections supporting digital subscriber line communications.

- 25 5. The communication system of claim 1, wherein each distribution gateway includes means for encrypting communications between an associated data device and the core network, thereby to protect access to communications routed via an intermediate distribution gateway to the core network.

6. The communication system of claim 1, further comprising an intermediate node coupled to the core network via an optical fibre, the intermediate node including:

5 an optical transceiver for converting optical communications into electrical impulses; and

a transceiver coupled to a plurality of distribution points, whereby the plurality of distribution points acquire access to the core network via the optical fibre.

7. The communication system of claim 1, wherein the communication resources
10 interconnecting said distribution gateways include at least one of RF channel resources, optical connections and wireline connections.

8. The communication system of claim 1, further comprising a billing centre coupled to the core network, the billing centre configured to generate and record
15 varying levels of charges for access to the core network in response to use by a distribution gateway of direct and indirect paths between the distribution gateway and the core network.

9. A virtual neighbourhood network comprising a plurality of interconnected
20 distribution gateways each providing network access capacity to associated data equipment via a combined communication resource, at least some of the plurality of interconnected distribution gateways coupled, in use, to a core network through an isolated connection and wherein each of said interconnected distribution gateways has:

25 control functionality arranged to administer broadband access to the core network through securing a share of the combined communication resource.

10. The virtual neighbourhood network of claim 9, wherein the control
30 functionality provides a routing function for broadband communications between a plurality of interconnected distribution gateways.

11. The virtual neighbourhood network of claim 9, wherein the control functionality operates according to at least one of:

- a bandwidth-driven requirement; and
- 5 a fault-driven basis to secure access to the core network.

12. The virtual neighbourhood network of claim 9, wherein the control functionality includes a prioritisation function that secures a guaranteed minimum bandwidth for communication with the core network for one of an associated data
10 device and a local area network (LAN).

13. The virtual neighbourhood network of claim 9, wherein the isolated connections are point-to-point connections supporting digital subscriber line communications.
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14. The virtual neighbourhood network of claim 9, wherein each distribution gateway includes means for encrypting communications between the core network and at least one of an associated LAN and an associated data device, thereby to protect access to communications routed via an intermediate distribution gateway to
20 the core network.

15. The virtual neighbourhood network of claim 9, further comprising an intermediate node coupled to the core network via an optical fibre, the intermediate node including:

- 25 an optical transceiver for converting optical communications into electrical impulses; and
- a transceiver coupled to a plurality of distribution points, whereby the plurality of distribution points acquire access to the core network via the optical fibre.

16. The virtual neighbourhood network of claim 9, wherein the communication resources interconnecting said distribution gateways include at least one of RF channel resources, optical connections and wireline connections.

5 17. The virtual neighbourhood network of claim 9, further comprising a billing centre coupled to the core network, the billing centre configured to generate and record varying levels of charges for access to the core network in response to use by a distribution gateway of direct and indirect paths between the distribution gateway and the core network.

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18. A method of providing broadband access to a core network coupled over multiple isolated connections to a plurality of distribution gateways each providing network access capacity to associated data equipment, the method comprising:

15 interconnecting at least some of the plurality of distribution to provide communication paths therebetween; and

administering access to the core network for one of said interconnected gateways through securing network access capacity using at least one of the multiple isolated connections indirectly accessible to said one of said interconnected gateways via an intermediate gateway.

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19. The method of providing broadband access according to claim 18, the method further comprising:

securing a guaranteed minimum bandwidth for communication between the core network and associated data equipment of at least some of the gateways.

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20. The method of providing broadband access according to claim 18, wherein the isolated connections are point-to-point connections supporting digital subscriber line communications.

21. The method of providing broadband access according to claim 18, the method further comprising:

selectively encrypting communications between each LAN and the core network, thereby to protect access to communications routed via an intermediate
5 distribution gateway to the core network.

22. The method of providing broadband access according to claim 18, the communication resources interconnecting said distribution gateways include at least one of RF channel resources, optical connections and wireline connections.

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23. The method of providing broadband access according to claim 18, the method further comprising:

generating a varying level of subscriber charge for access to the core network in response to use by a distribution gateway of direct and indirect paths
15 between the distribution gateway and the core network.

24. A home-gateway providing network access, in use, to at least one of an associated local area network and an associated data device, the distribution point connectable, in use, at least one other home-gateway having access to a core
20 network via a first isolated connection, the home-gateway comprising:

control functionality arranged to administer access to the core network through securing network access capacity through the first isolated connection.

25. The home-gateway of claim 24, further connectable, in use, to the core network through a second isolated connection and wherein the control functionality is further arranged to administer access to the core network through securing network access capacity through the first isolated connection and the second isolated connection.

26. The home-gateway of claim 24, wherein the control functionality operates according to at least one of:

- a bandwidth-driven requirement; and
- a fault-driven basis to secure access to the core network.

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27. The home-gateway of claim 24, wherein the control functionality includes a prioritisation function that secures a guaranteed minimum bandwidth for communication with the core network for said at least one of its associated local area network and the associated data device.

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28. The home-gateway of claim 24, wherein at least some of the isolated connections are point-to-point connections supporting digital subscriber line communications.

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29. The home-gateway of claim 24, further including means for encrypting communications between said at least one of the associated LAN and said associated data device and the core network, thereby to protect access to communications routed via said other home gateway to the core network.

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30. The home-gateway of claim 24, wherein the home gateway includes an RF transceiver to provide both connectivity to said at least one of the associated LAN and said associated data device and interconnection to said other home gateway.

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31. A computer program product for a home-gateway that controls broadband connection to a core network over isolated communication resources, the computer program product comprising:

- code that arbitrates interconnection of the home-gateway with at least one further home-gateway connectable to the core network; and

- code that directs the home gateway to administer access to the core network for the home gateway through securing a share in network access capacity

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provided by the isolated communication resources associated with both the home-gateway and the at least one further home-gateway;

wherein the codes reside in a computer readable medium.

- 5 32. The computer program product of claim 31, further comprising:
 code that secures a guaranteed minimum bandwidth for communication
 between the core network and a data communication device coupled to the home-
 gateway.
- 10 33. The computer program product of claim 31, wherein at least some of the
 isolated communication resources are point-to-point connections supporting digital
 subscriber line communications.
34. The computer program product of claim 31, further comprising:
15 code that encrypts communications between data communication
 equipment, associated with the home-gateway, and the core network, thereby to
 protect access to communications routed via the at least one further home-gateway
 to the core network.
- 20 35. The computer program product of claim 31, communication resources
 interconnecting said home-gateways include at least one of RF channel resources,
 optical connections and wireline connections.
36. A method of generating a charge against a subscriber obtaining broadband
25 access to a core network through isolated connections between a plurality of
 interconnected distribution gateways each supporting data equipment, the
 subscriber being affiliated with a particular distribution gateway, and wherein the
 method comprises:
 generating a varying level of subscriber charge for broadband access to the
30 core network in response to use by the subscriber of direct and indirect isolated

connections between their associated distribution gateway and the core network;
and

recording the varying level of charge in a database for subsequent billing
purposes.

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37. The method of generating a charge according to claim 36, wherein the
isolated connections are point-to-point connections supporting digital subscriber line
communications.

10 38. The method of generating a charge according to claim 36, wherein the
varying level of subscriber charge is bandwidth-demand dependent.

39 A computer program product generating a charge against a subscriber
obtaining broadband access to a core network through isolated connections
15 between a plurality of interconnected distribution gateways able to support data
communication devices, the subscriber being affiliated with a particular distribution
gateway, the computer program product comprising:

code that generates a varying level of subscriber charge for broadband
access to the core network in response to use by the subscriber of direct and
20 indirect isolated connections between their associated distribution gateway and the
core network; and

code that records the varying level of charge in a database for subsequent
billing purposes;

wherein the codes reside in a computer readable medium.

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40. Network control equipment responsive to multiple isolated connections to a
plurality of home-gateways each providing network access capacity to local data
devices serviceable thereby, at least some of the plurality of home-gateways
interconnected through communication resources and wherein said interconnected

home-gateways each secure network access via multiple isolated connections, the network control equipment comprising:

5 a consolidation function arranged to direct downstream information packets to a data device associated with a first home-gateway via both a direct isolated connection and an indirect direct isolated connection via a second home-gateway.

10 41. Network control equipment according to claim 40, wherein the consolidation function is operable having regard to congestion conditions on the multiple isolated connections.

42. Network control equipment according to claim 40, wherein the consolidation function is operable having regard to priority traffic using the indirect isolated connection.

15 43. A method of communicating data packets between a network that is coupled to a plurality of distribution gateways through multiple isolated connections, each of the plurality of distribution gateways providing network access capacity to local data devices serviceable thereby, at least some of the plurality of distribution gateways interconnected through communication resources and wherein said interconnected
20 distribution gateways secure network access via multiple isolated connections, the method comprising:

sending data packets between a data device, associated with a first distribution gateway, and the network in an un-encrypted form across a direct isolated connection existing between the network and the distribution gateway; and

25 sending encrypted data packets between the data device and the network across an indirect isolated connection existing between the network and a second distribution gateway interconnected to the first distribution gateway.

30 44. A method of generating a charge for provisioning network access to a first subscriber in a communication system in which a plurality of subscribers are able to

obtain broadband access of varying bandwidth to a core network using multiple isolated connections between a plurality of interconnected distribution gateways and the network, the first subscriber being affiliated with a first distribution gateway interconnected to at least one other distribution gateway such that a combined
5 broadband access capacity supported by the first distribution gateway and the at least one other distribution gateway can be shared therebetween, the method comprising:

monitoring and recording access made to a direct isolated connection between the first distribution gateway and the network by subscribers other than the
10 first subscriber;

charging the first subscriber for leasing the direct isolated; and

discounting the charge for provisioning network access to the first subscriber based on access made to bandwidth supported by the direct isolated connection by subscribers other than the first subscriber.

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45. The method of claim 44, wherein the discounting is subject to a recorded utilisation of the direct isolated connection by subscribers.

46. The method of claim 44, wherein the discounting is subject to meeting a
20 predetermined utilisation of the direct isolated connection by the subscribers other than the first subscriber.